a project of SOUTHERN CALIFORNIA ASSOCIATION of GOVERNMENTS

CLIMATE & ECONOMIC DEVELOPMENT PROJECT
SOUTHERN CALIFORNIA

Climate & Economic Development Project

Transportation and Land Use (TLU) Technical Work Group (TWG)

Teleconference #1

(September 28, 2010)

Southern California Association of Governments

The Center for Climate Strategies

http://cedp.scag.ca.gov

Agenda

- Welcome and Roll Call
- Purpose and Goals of PSC and TLU TWG Meeting #1
- Update on regional goal setting by SCAG
- Background and Review of the PSC and TWG process and resources, including role of the TLU TWG
- Review and discussion of the TLU Catalog of Potential Actions
- Review and discussion of the Inventory and Forecast Report
- Next Steps for the TWG
- Agenda, Date and Time for Next Meetings
- Public Comments
- Announcements
- Adjourn

OVERVIEW

CEDP: Goals

Create cost-effective and equitable strategies for:

- Equitable economic development
- Pollution reduction
- Housing and transportation planning
- Economically viable and livable communities
- Energy, Commerce, and Resource management

All yielding a regional strategy that will also reduce GHG's.

CEDP: Overview

- AB 32 and SB 375 establish goals, new standards, programs and partnerships for California's GHG emissions.
- SB 375 gives organizations such as SCAG the responsibility to work with local jurisdictions to develop a regional strategy for reducing GHG. AB 32 requires regional and local actions as well.
- SCAG wants to work with partner agencies, local business leaders, and technical experts from the region to identify a range of options to meet the region's needs
- A major part of the effort is the Project Stakeholders Committee - citizens representing diverse local and regional perspectives from business; industry; the building/ construction, housing and commercial real estate sectors;

  transportation interests; environmental groups; government; and academia.

REGIONAL GOALS UPDATE

Regional Goal Setting

ARB approved GHG reduction target for the SCAG region

(September 23, 2010)

2020 Target – 8%

2035 Target – 13%*

*2035 target conditioned on discussions with SCAG

PROCESS AND WORK PLAN

Stepwise Planning Process

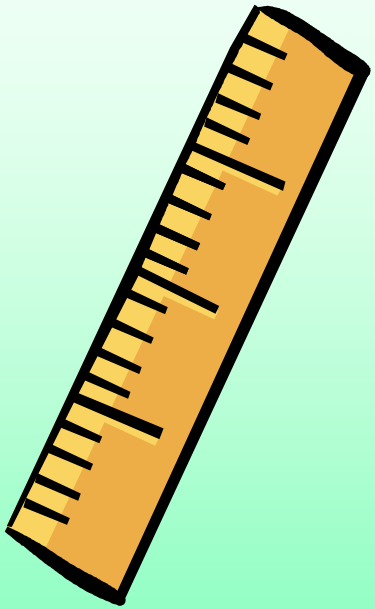
1. Get organized
2. Review and refine inventory & forecast of emissions
3. Identify a full range of possible actions
4. Identify initial priorities for analysis
5. Develop straw policy design proposals
6. Quantify initial GHG reductions and costs/savings
7. Fully develop policy option templates, including externalities, feasibility issues, environmental justice concerns, etc.
8. Develop alternatives to address barriers as needed
9. Aggregate and integrate results
10. Finalize recommendations

Building Consensus

- Deliberative democracy applied to governance
  - Comprehensive
  - Stepwise
  - Fact based
  - Transparent
  - Inclusive
  - Collaborative
  - Consensus driven

Ground Rules

- Supportive of the process
- Best effort, good faith
- Attendance at meetings
- Equal footing
- Stay current with information
- No backsliding
- Do not represent the PSC or TWG
- Make objective and timely contributions



Fact Finding

- Preliminary fact finding
  - Inventory and forecast of GHG emissions
  - Inventory of regional actions, studies
  - Catalog of potential new actions
- Joint fact finding and policy development
  - Baselines: Regional, sector and policy specific inventory and forecast of GHG emissions
  - Policy Development: Priorities for analysis, policy description, policy design specifications, implementation mechanisms, alternative solutions, GHG reduction potential, cost effectiveness

Technical and Policy Decisions

- Policy Choices
  - Which policy options
  - How they are designed
  - How they are implemented
- Analysis Choices
  - Which data sources
  - Which key assumptions
  - Which analytical methods
  - Role and value of co-benefits

Decision Criteria

- GHG Reduction Potential (MMTCO2e)
- Direct or Microeconomic Impacts (Cost or Cost Saved Per Ton GHG Removed)
- Indirect or Macroeconomic Impacts (employment, income, prices, economic growth, market share)
- Distributional Impacts (entity size, socio economic status, location)
- Externalities (co-benefits and costs, such as energy and environmental improvements
- Feasibility Issues

Transparency

- Policy Selection & Design
  - Options, Timing, goals, coverage, implementation tools
- Technical analysis
  - Data sources
  - Quantification methods
  - Key assumptions
  - Uncertainties

End Product:
Plan of Action, Final Report

Front Matter

- Executive Summary
- Background, Purpose And Goals
- Emissions Inventory & Forecast
- PSC Recommendations & Results
  - SB 375
    - Transportation & Land Use, Systems, Demand Management, Infrastructure and Investment
  - AB 32
    - Other Sectors: Agriculture, Forestry, Energy Supply, Residential, Commercial, Industrial, Waste Management, Cross-Cutting Issues

Appendices

- PSC, TWG, TAP and TAC members
- Principles and Guidelines
- TWG Policy Option Results
- TWG Methodology Guidelines
- TWG Policy Option Templates
  - Transportation & Land Use, Systems, Demand Management, Infrastructure
  - Other Sectors: Agriculture, Forestry, Energy Supply, Residential, Commercial, Industrial, Waste Management, Cross-Cutting Issues
- Study References

Step 1: Get Organized

- Review process and timelines
- Review preliminary fact finding
  - Inventory and forecast
  - Analysis of recent actions
- Plan next steps

Technical Work Group Roles

Make recommendations to the PSC based upon mitigation and adaptation technologies, practices and policies as identified by the PSC:

- Identify full range of potential actions
- Identify suggested priorities for analysis
- Suggest straw policy designs
- Assist with analysis, development and review of options
- Assist with development of policy alternatives
- Review and assist with the state GHG inventory and forecast

Technical Work Groups

- Transportation System and Infrastructure (TSI)
- **Transportation and Land Use (TLU)**
- Energy, Commerce and Resources (ECR)

TWG Sectors

Transportation System & Infrastructure

Transportation & Land Use

Energy, Commerce & Resources

Step 2: Review and Refine Inventory and Forecast

- Scope of coverage
- Data sources
- Methods
- Assumptions

Step 3: Expand the Catalog of State Actions

- Over 300 actions taken by US states
  - Existing, planned and proposed state level actions
  - Wide variety of US states
  - All sectors
  - Wide variety of implementation mechanisms
  - Will include key SCAG region actions
- TWGs will propose new potential actions
  - Starting place for identification of priorities for analysis

Step 4: Identify Initial Priorities for Analysis

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	Other Considerations: Jobs, Env. Justice, Externalities, Feasibility	Priority for Analysis	Notes / Related Actions in NY
AFW-1	AGRICULTURE – PRODUCTION OF ENERGY AND MATERIALS					
1.1	Expanded Use of Biomass Feedstocks for Electricity, Heat, or Steam Production					
1.2	In-state Liquid Biofuels Production					
1.3	Manure Digesters/Other Waste Energy Utilization					
1.4	Improving Energy Capture from Biomass Heat					
1.5	Expand Use of Bio-based Materials					

- PSC identifies about 50 initial potential options for further analysis and development.

Step 5: Craft Straw Policy Design Proposals

- TWGs propose initial policy option design ("straw proposals") with key parameters of analysis
  - Timing
  - Goals
  - Coverage
- CCS works with TWGs to set up quantification
- Options are quantified and fleshed out for review and revision by the PSC
- PSC revisits list of potential priorities, as needed

Step 6: Prepare First Round of Quantification

- CCS prepares quantification memo, specific options for analysis of draft actions
  - US EPA Economic Guidelines, other standard references applied to climate actions
- Quantification includes:
  - GHG reduction potential (mitigation)
  - Risk reduction potential (adaptation)
  - Cost per ton of GHG removed/adaptive risk reduced
  - Direct cost/cost savings of action
- Aggregate/Integrative impacts

Step 7: Develop Full Policy Option Template

- Policy Description (Concept)
- Policy Design (Goals, Timing, Coverage)
- Potential Implementation Methods
- Related Programs and Policies (BAU)
- Quantification of costs, results
  - Data Sources, Methods and Assumptions
  - Key Uncertainties
- Externalities, as Needed
- Feasibility Issues, as Needed
- Level of Group Support
- Barriers to Consensus, if any

Step 8: Identify Alternatives to Resolve Conflicts

- Clarification, expanded information or modifications:
  - Policy Design (goals, timing, coverage)
  - Implementation methods
  - Modifications to analysis (data sources, methods, assumptions)
  - List of options

Step 9: Conduct Aggregate Analysis and Relate to Goal

- Integrate measures within TWGs
- Integrate measures across TWGs
- Remove double counting
- Assess supply and demand interactions
- Assess other interactions, externalities, if/as needed
- Assess needs for margin of safety, etc.
- Evaluate effectiveness at meeting the goal

Policy Action Portfolio

Sector	Codes and Standards	Targeted Funding	Technical Assistance	Price Mechanisms	Agreements	Disclosure	Information and Educations
Agriculture	?	?	?	?	?	?	?
Forestry	?	?	?	?	?	?	?
Waste	?	?	?	?	?	?	?
Transportation	?	?	?	?	?	?	?
Heat & Power Supply	?	?	?	?	?	?	?
Residential, Commercial, Industrial Energy Use	?	?	?	?	?	?	?
Full Economy	?	?	?	?	?	?	?

Step 10: PSC Develops Final Report

The PSC will organize their recommendations based upon the work of the TWGs into a draft report.

After taking public comment and holding two public meetings to gather comments, the PSC will issue a final report.

CATALOG OF ACTIONS

Catalog of Actions

- Starting place for identification of PSC priorities
- Over 440 actions listed by sector
- Existing, planned and proposed regional actions
- All sectors covered with emphasis on transportation
- Wide variety of implementation mechanisms possible
- PSC/TWGs will add new potential actions

Sources for Additions to SCAG Transportation Catalogs

SCAG Official Documents

- **SCAG RCP Energy Plan**
- **SCAG RTP Transportation Strategy**
- **SCAG TDM Appendix**
- **SCAG Advisory Land Use Elements**

Western States Climate Action Plans, including:

- California
- Montana
- New Mexico
- Arizona
- Washington
- Colorado

Sources for Additions to SCAG Transportation Catalogs

Sustainability Plans:

-Burbank
-Claremont
-Long Beach
-Santa Monica

Climate Action Plans:

-Riverside
-Laguna Beach
-Los Angeles
-Sacramento

Green Plans:

-Manhattan Beach
-Pasadena
-Riverside
-San Bernardino

Discussion of TLU Catalog

- See “Catalog” and “Brief Descriptions” documents
  - posted on website

Updating the TLU Catalog

- The TLU and TSI Catalogs have been updated using the report titled “Quantifying Greenhouse Gas Mitigation Measures” which was released by CAPCOA (California Air Pollution Control Officers Association) earlier this year
- This report contains model greenhouse gas reduction policies prepared by CAPCOA for the inclusion in General Plans
- More than 50 additional policies focused on land use, transportation and infrastructure management have been added to the catalogs

Main TLU Categories from the CAPCOA Report

DRAFT INVENTORY AND FORECAST

Inventory Approach

- Standard California Air Resources Board (ARB), US Environmental Protection Agency (US EPA), and Intergovernmental Panel on Climate Change (IPCC) methodologies, guidelines, and tools
- Emphasis on transparency, consistency, and significance
- Preference for county-level or SCAG regional data, where available
- ARB inventory data scaled to SCAG where regional data not available

Projection Approach

- Reference case—Recent Actions
  - Actions included in SCAG's projections of population, employment, and vehicle miles traveled (VMT) for 2012 Regional Transportation Plan (RTP) projection would be accounted for in analysis
  - Reductions from Pavley I vehicle standards and the Low Carbon Fuel Standard specifically accounted for in onroad baseline emissions
  - Electricity production baseline follows ARB 20% RPS scenario

Projection Approach

- Growth assumptions from existing sources
  - SCAG population and employment forecasts
  - ARB 2020 GHG projections
  - US Census Bureau
  - US Energy Information Administration (EIA)

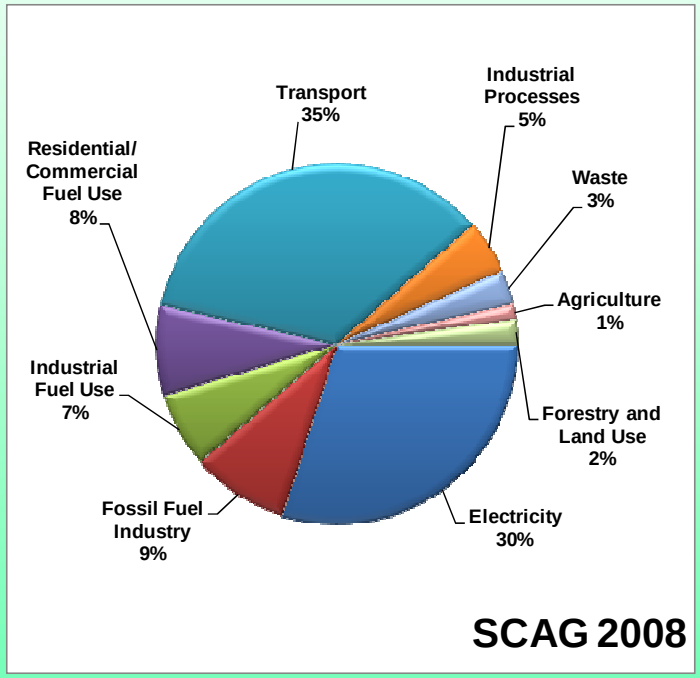
Coverage

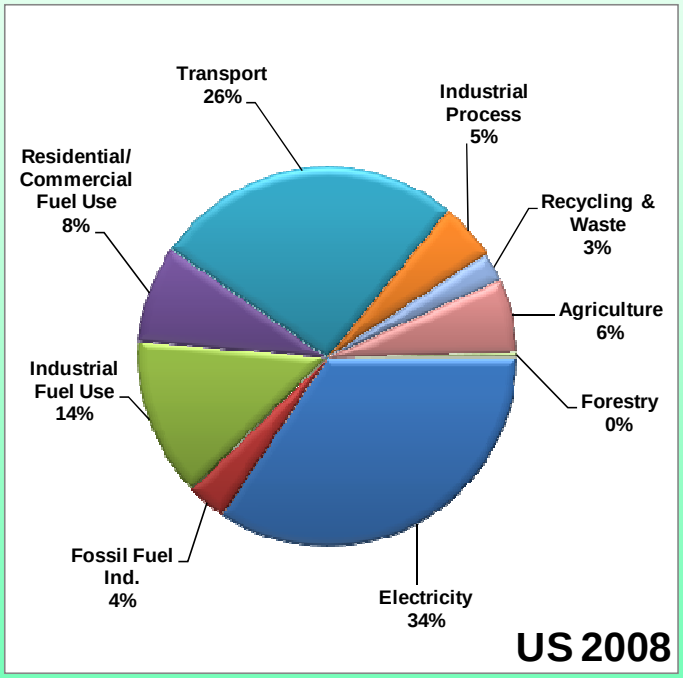
- Six gases per USEPA and UNFCCC guidelines
  - Carbon Dioxide (CO_2), Methane (CH_4), Nitrous Oxide (N_2O, Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulfur Hexafluoride (SF_6)
- All major emitting sectors
  - Transportation (onroad and nonroad)
  - Electricity Supply & Demand
  - Residential, Commercial, Industrial (RCI) Fuel Use and Non-fuel Use Processes
  - Natural gas pipeline transmission & distribution
  - Agriculture, Forestry, and Waste
- Emissions expressed as CO_2 equivalent
  - 100-year global warming potentials
    - CO_2 = 1; CH_4 = 21; N_2O = 310; HFC-23 = 11,700; SF6 = 23,900

Key Points

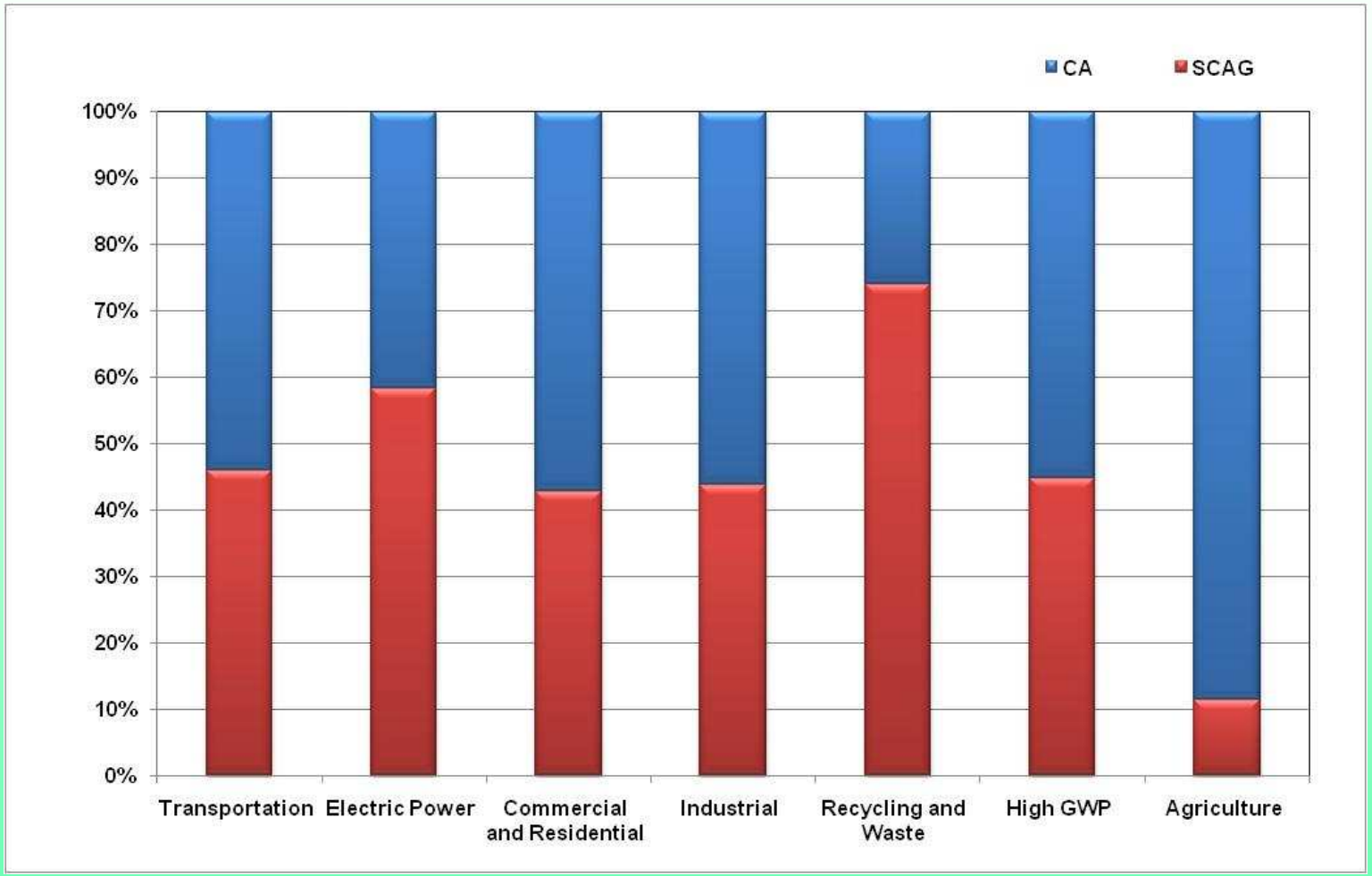
- Preliminary draft for SCAG, PSC, and TWG review and revision, as needed
- Helpful for diagnosis of GHG emissions, but not a baseline for modeling or compliance for individual options
- Consumption and Production methods
  - Consumption for all sectors
  - Production and consumption for electricity generation
    - Very simplified approach, used for initial analysis
- Gross and Net methods

SCAG & US Emissions By Sector, Year 2008

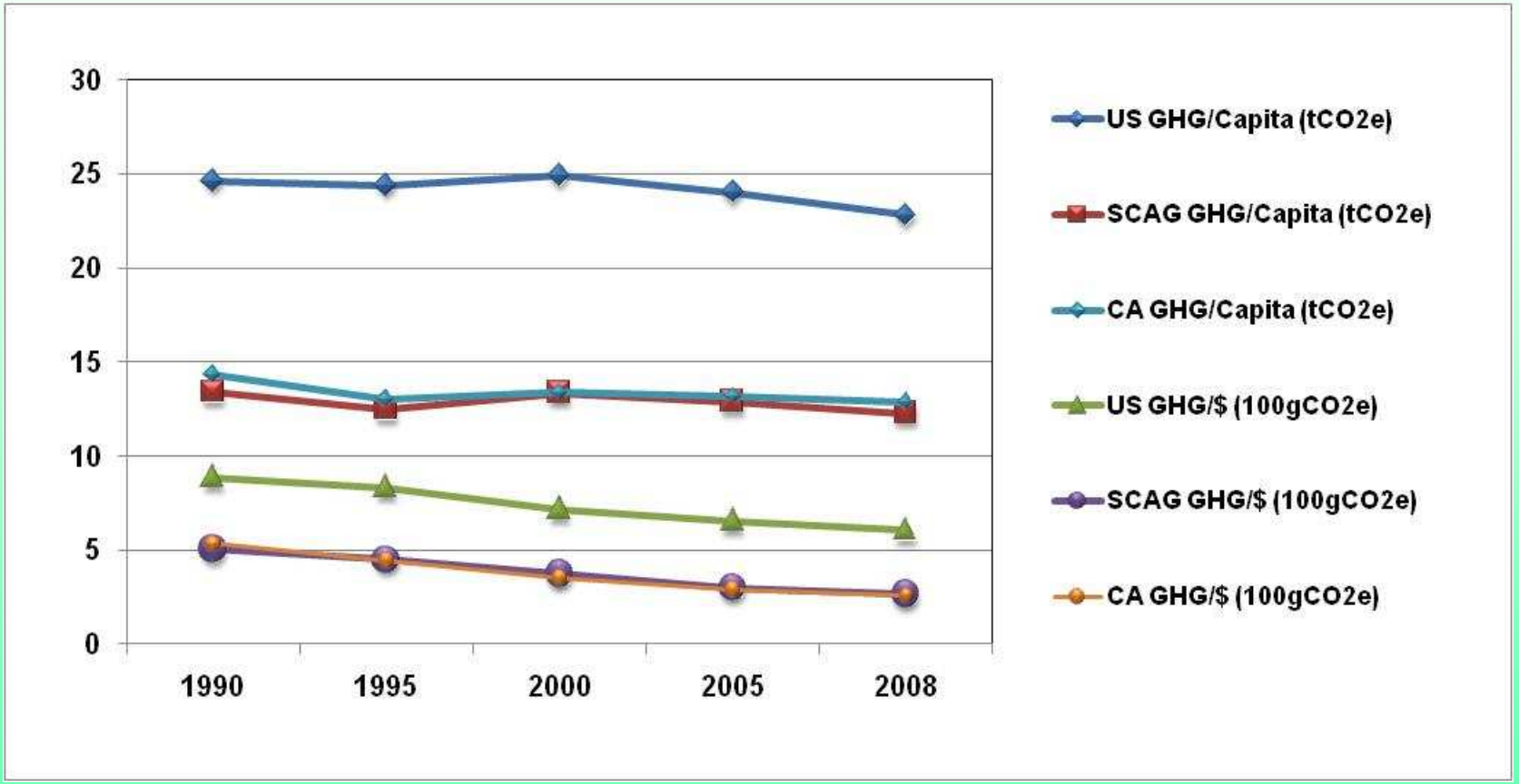




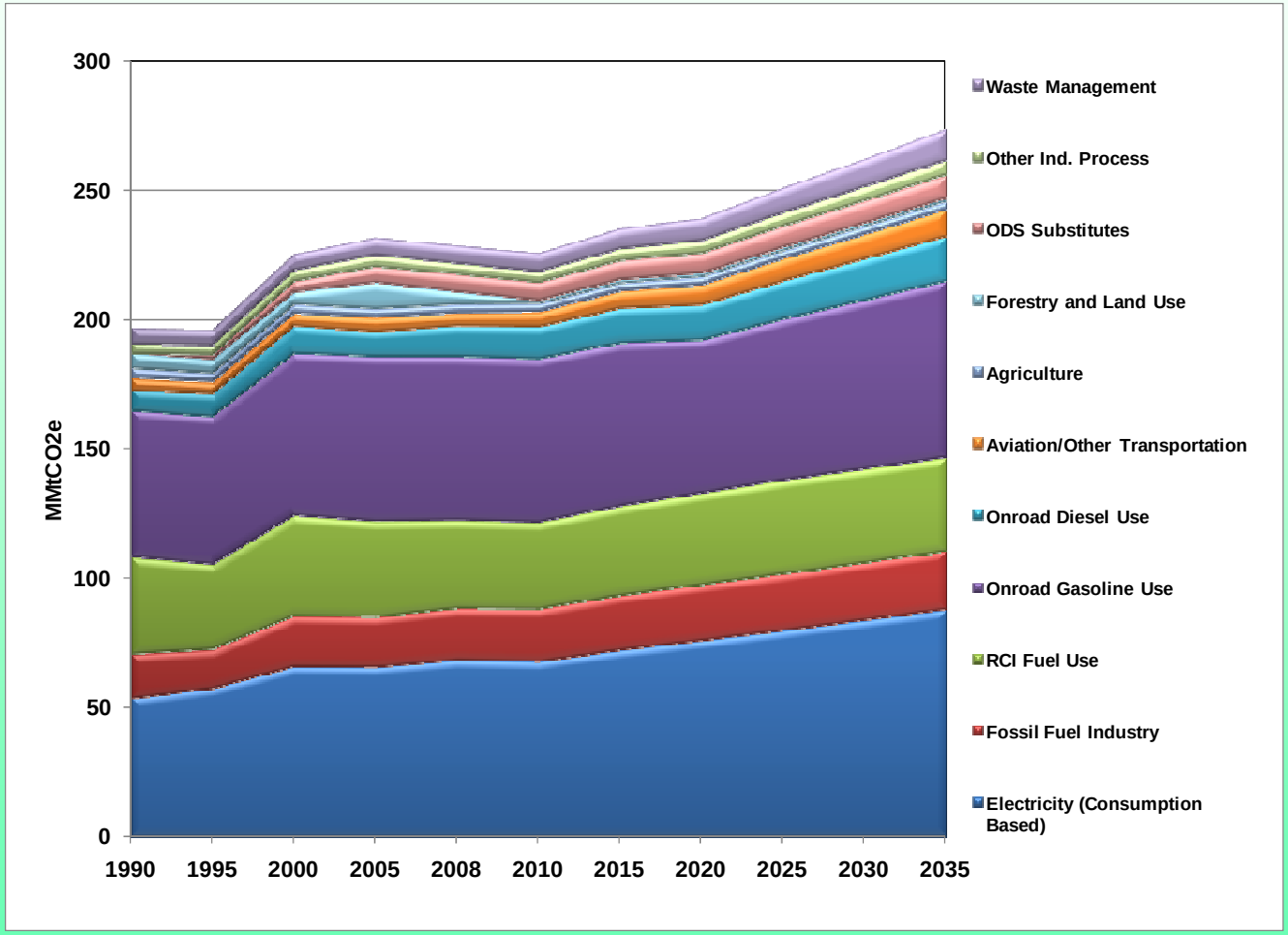
SCAG's Contribution to CA Emissions: 2008



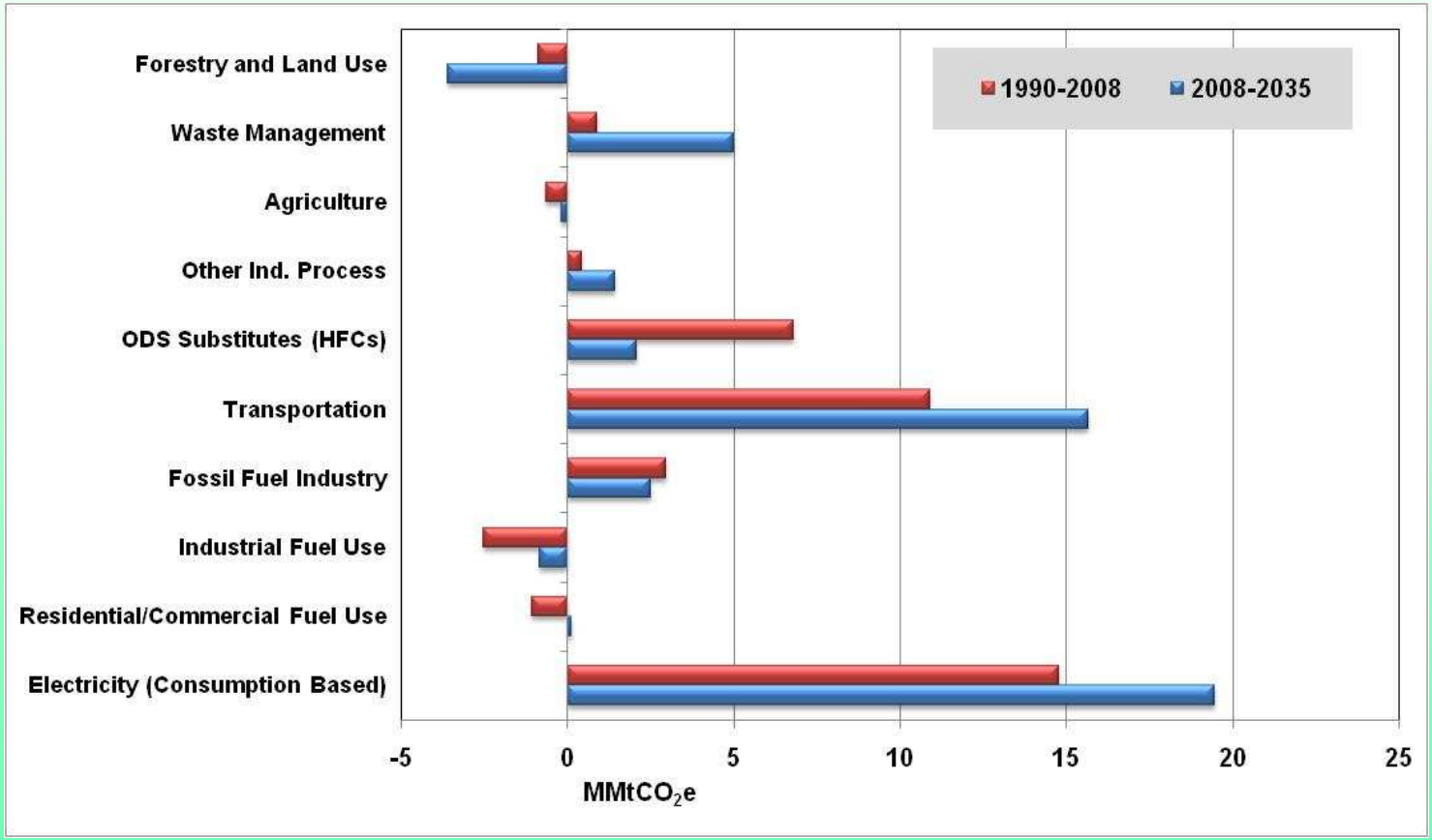
Per Capita and GSP/GDP GHG Emissions: SCAG, CA, and US, 1990-2008



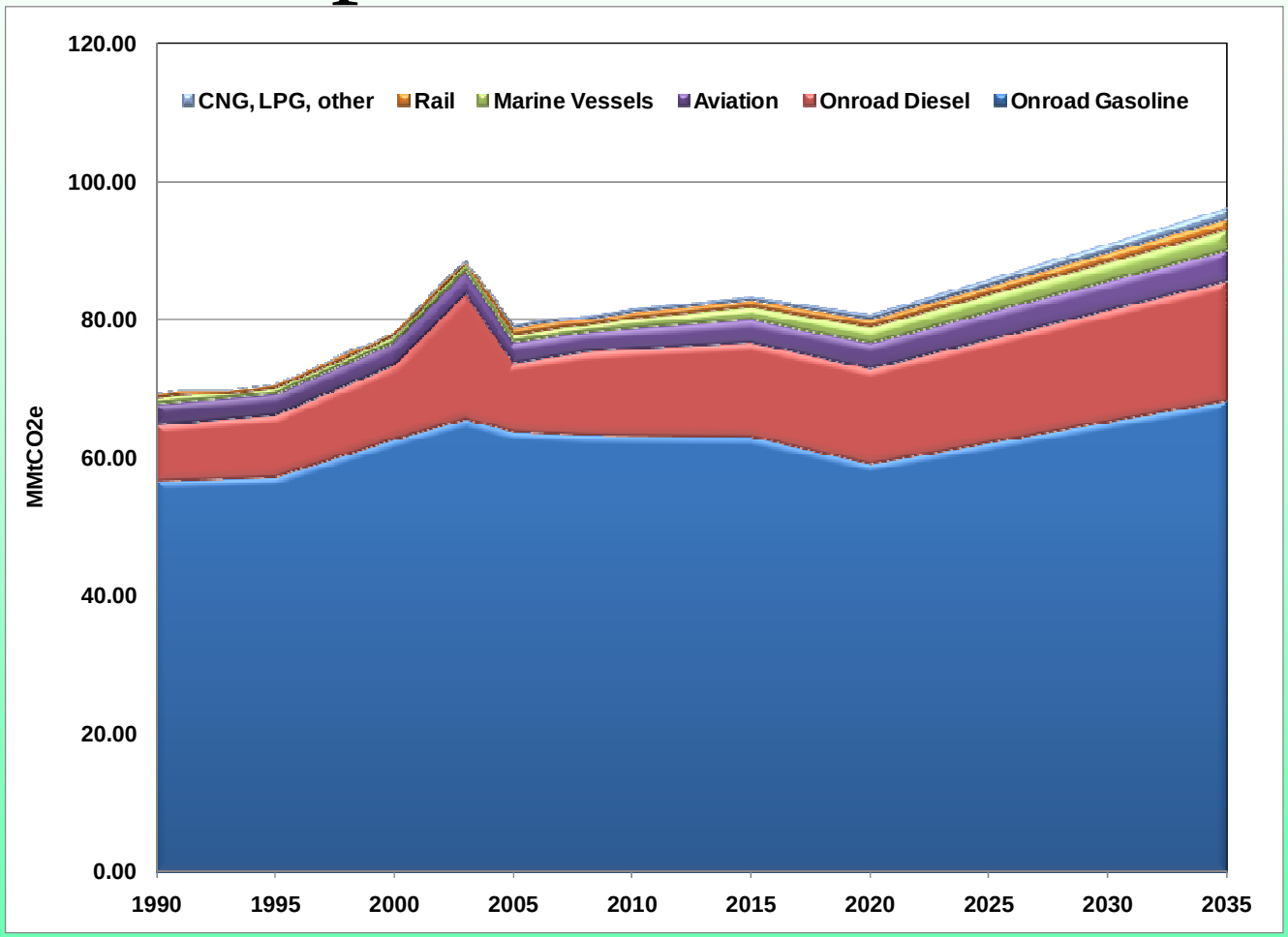
Gross SCAG GHG Emissions by Sector, 1990-2035



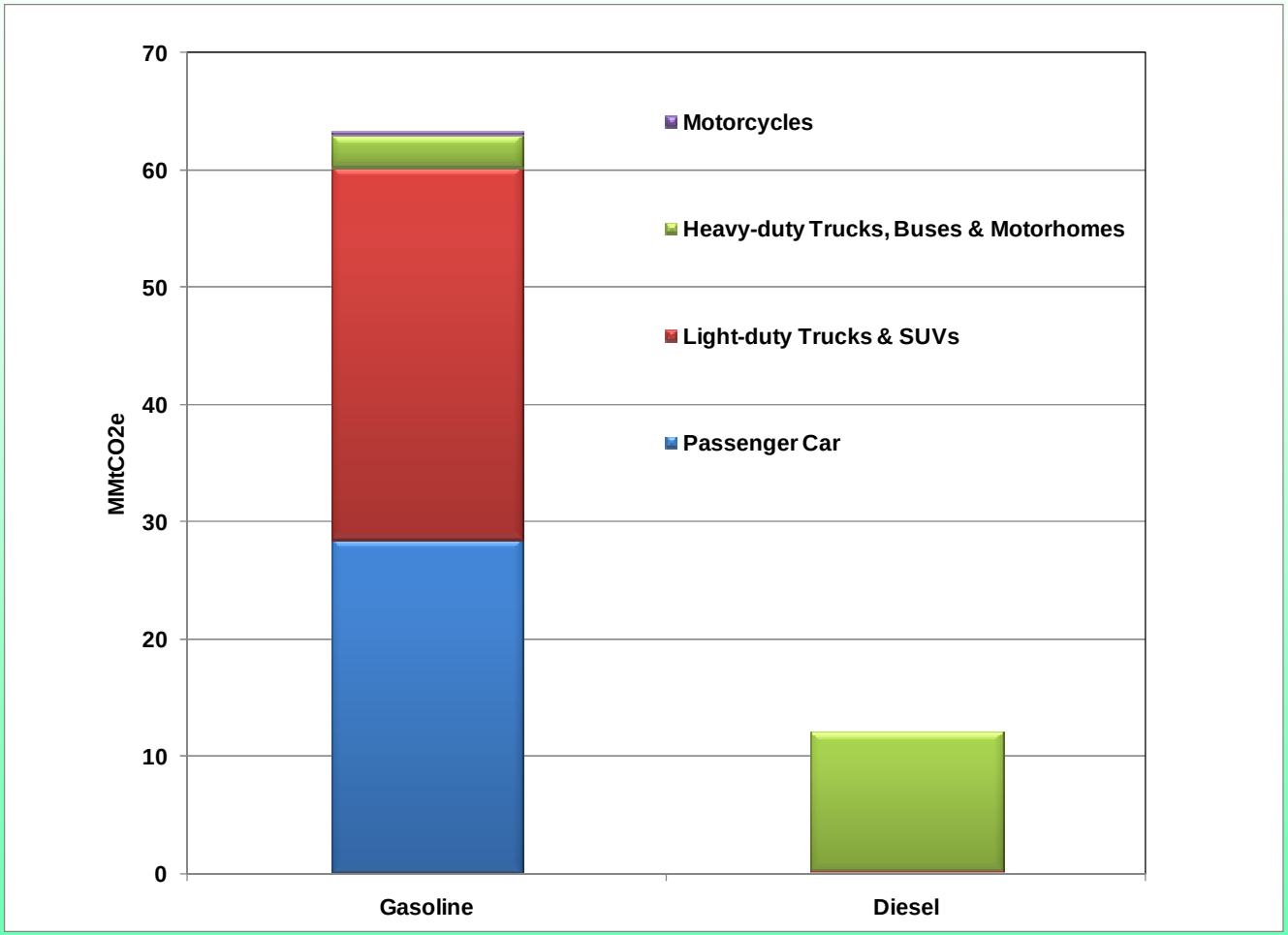
SCAG Emissions Growth ($MMtCO_2e$ Basis)



Transportation Emissions



2008 On-road Gasoline and Diesel



Transportation Data Sources

- Onroad Gasoline and Diesel
  - ARB's EMFAC2007 Model
  - Vehicle miles traveled (VMT) data provided by SCAG
- Commercial Aircraft:
  - Landing and take-off (LTO) data by aircraft model from Bureau of Transportation Statistics (BTS)
  - Total LTOs from Air Traffic Activity Data System (ATADS)
  - SCAG operations forecast
- Commercial Marine:
  - Ports of Los Angeles (POLA) and Long Beach (POLB), and ARB GHG inventories for ports
  - Port tonnage from Waterborne Commerce Statistics Center
  - 2008 RTP containerized cargo forecast
- Rail Diesel
  - State-level fuel consumption data from EIA
  - State and regional rail length from EPA National Emissions Inventory (NEI)
  - 2008 RTP rail traffic volume forecast

Transportation Data Sources (cont)

- Marine Gasoline
  - State-level fuel consumption data from EIA
  - Recreational marine allocation data from ARB's OFFROAD model
- Aviation gasoline
  - State-level fuel consumption data from EIA
  - State and regional general aviation operations from ATADS
  - FAA TAF general aviation forecasts
- Compressed Natural Gas (CNG) and Liquefied Petroleum Gas (LPG)
  - State-level fuel consumption data from EIA
  - VMT for state and region from EMFAC
  - Regional forecast from EIA's Annual Energy Outlook 2010 (AEO2010)

Transportation Inventory Methods (1990-2008)

- Onroad Gasoline and Diesel
  - EMFAC2007 run using SCAG VMT allocated to vehicle types based on EMFAC defaults
  - EMFAC CO_2 output adjusted by adding carbon from total hydrocarbons (THC) and CO
  - N_2O from gasoline, estimated from NO_X output based on ARB formula
  - N_2O from diesel, estimated from EMFAC diesel consumption and ARB emission factor
  - CH_4 – EMFAC output
- Commercial Aviation
  - LTO-based emission factors from IPCC applied to LTOs by aircraft model from BTS
  - Average emission factor for small commuter planes used for commuter and air taxi LTOs not included in BTS data

Transportation Inventory Methods (1990-2008) (cont)

- Commercial Marine
  - Emissions taken from port inventories and scaled to other years based on port tonnage
- Rail, Aviation gasoline, Marine Gasoline, CNG, and LPG
  - State-level fuel consumption allocated to region
  - EPA emission factors applied to estimated regional fuel consumption

Transportation Projection Methods (2009-2035)

- Onroad Gasoline and Diesel
  - Future year EMFAC runs using VMT forecasts from SCAG
  - Pavley I and low carbon fuel standard (LCFS) reductions applied to EMFAC output
- Aviation
  - SCAG commercial aircraft operations forecast
  - Commercial aircraft projections adjusted to account for projected fuel efficiency improvements using 2010 EIA Annual Energy Outlook data
  - Aviation gasoline forecast based on general aviation forecasts from Federal Aviation Administration (FAA) Terminal Area Forecast (TAF)
- Commercial Marine, Rail
  - Projected based on 2008 RTP forecasts
- CNG, LPG
  - Projected based on regional forecasts from AEO2010

Transportation

- Key Assumptions
  - EMFAC default vehicle mix
  - EMFAC VMT historical growth rate (used to back-cast from 2003 to 1990)
- Key Uncertainties
  - Fuel consumption adjustments
  - Future gasoline and diesel not adjusted to account for increasing use of ethanol, CNG, and LPG
  - Average emission factor used for commuter/air taxi flights that are not available by aircraft model

Comments / Questions on Draft I&F from PSC Meeting #1

- Is the new fuel efficiency standard for diesel included in the draft I&F?
- Why do the transportation sector emission projections seem larger than the expected population increase?
- Are bio-fuels estimated based on direct emissions or life-cycle emissions?
- Are there limitations associated with using state-level fuel consumption data to adjust EMFAC model outputs for the SCAG region?
- What is the level of detail at which the emissions were prepared for diesel buses, electricity used for rail transportation, and to support assessment of policies in general for the movement of goods?
- Can we break out emissions associated with goods movement from other types of transportation source emissions?

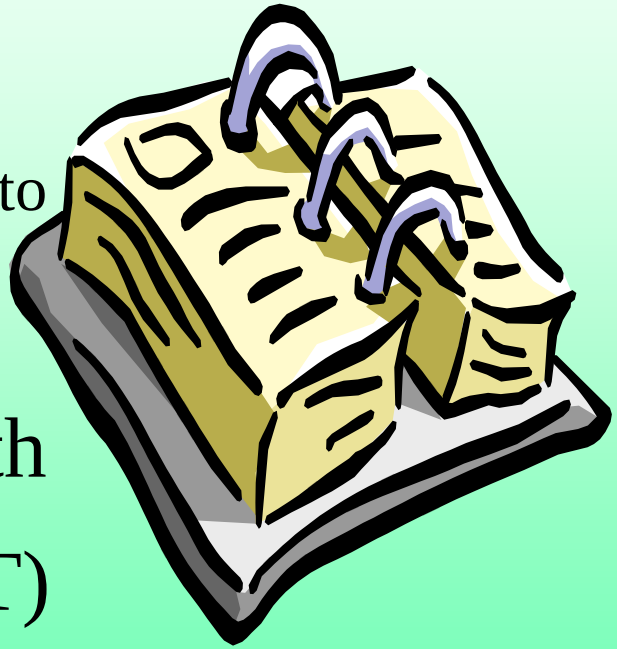
NEXT STEPS

Next Steps for TLU Technical Work Group

- Approve additions to the Catalog
- Review and discuss improvements to the GHG emissions Inventory and Forecast

Next TLU TWG Meeting

- Agenda:
  - Review/Approve expanded Catalog of State Actions
  - Review TWG suggested updates to the emissions inventory and projection
- Date: Tuesday, October 12th
- Time: 12.30pm-2.30pm (PT)



Public Input, Announcements

Adjourn